

What is claimed is:

1. A transmission direction switching device for a half-duplex communication apparatus, said
5 half-duplex communication apparatus including a universal asynchronous receiver transmitter (UART) and a half-duplex communication interface driver having a signal subtraction function and connected to said UART via a sending line and to said
10 transmission direction switching device via a direction control line; said transmission direction switching device comprising:

15 a data transmission detector coupled to said sending line for detecting any data to be sent and sending said data if such data exists; and

20 a direction-switching rule executor for receiving said data sent out by said data transmission detector, and sending a direction switching signal via said direction control line to said half-duplex communication interface driver to set a transmission direction of said half-duplex communication interface driver to a sending direction when said
25 data received from said data transmission detector is a signal 0 or a low signal, or sending a direction

switching signal via said direction control line
to said half-duplex communication interface driver
to set a transmission direction of said half-duplex
communication interface driver to a receiving
5 direction when said data received from said data
transmission detector is a signal 1 or a high signal.

2. The transmission direction switching device as
claimed in claim 1, wherein said half-duplex
10 communication interface driver comprises a driver
in compliance with RS485 standard.
3. The transmission direction switching device as
claimed in claim 1, wherein said transmission
15 direction switching device is a programmable logic
device.
4. A transmission direction switching device for a
half-duplex communication apparatus, said
20 half-duplex communication apparatus including a
universal asynchronous receiver transmitter (UART)
and a half-duplex communication interface driver
having a signal subtraction function and connected
to said UART via a sending line and to said
25 transmission direction switching device via a
direction control line; said transmission direction

switching device comprising:

a data transmission detector coupled to said sending line for detecting any data to be sent and sending
5 said data if such data exists; and

a direction-switching rule executor for receiving said data sent out by said data transmission detector and generating a negative data in reverse to said
10 data received from said data transmission detector; and said direction-switching rule executor sending a direction switching signal via said direction control line to said half-duplex communication interface driver to set a transmission direction
15 of said half-duplex communication interface driver to a sending direction when said negative data is a signal 0 or a low signal, or sending a direction switching signal via said direction control line to said half-duplex communication interface driver
20 to set a transmission direction of said half-duplex communication interface driver to a receiving direction when said negative data is a signal 1 or a high signal.

25 5. The transmission direction switching device as claimed in claim 4, wherein said half-duplex

communication interface driver comprises a driver
in compliance with RS485 standard.

6. The transmission direction switching device as
5 claimed in claim 4, wherein said transmission
direction switching device is a programmable logic
device.
7. A method for switching transmission direction of
10 a half-duplex communication apparatus, said
half-duplex communication apparatus including a
universal asynchronous receiver transmitter (UART),
a half-duplex communication interface driver having
a signal subtraction function, and a transmission
15 direction switching device; said half-duplex
communication interface driver being connected to
said UART via a sending line and to said transmission
direction switching device via a direction control
line; and said transmission direction switching
20 device including a data transmission detector and
a direction-switching rule executor; said method
comprising the steps of:

detecting any data transmission by using said data
25 transmission detector coupled to said sending line
to detect any data to be sent and sending said data

if such data exists; and

implementing transmission direction switching by
using said direction-switching rule executor to
5 receive said data sent by said data transmission
detector, such that said direction-switching rule
executor sends a direction switching signal via said
direction control line to said half-duplex
communication interface driver to set a transmission
10 direction of said half-duplex communication
interface driver to a sending direction when said
data received from said data transmission detector
is a signal 0 or a low signal, or sends a direction
switching signal via said direction control line
15 to said half-duplex communication interface driver
to set a transmission direction of said half-duplex
communication interface driver to a receiving
direction when said data received from said data
transmission detector is a signal 1 or a high signal.

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8. The method for switching transmission direction as
claimed in claim 7, wherein said half-duplex
communication interface driver comprises a driver
in compliance with RS485 standard.

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9. The method for switching transmission direction as

claimed in claim 7, wherein said transmission direction switching device is a programmable logic device.

- 5 10. A method for switching transmission direction of
 a half-duplex communication apparatus, said
 half-duplex communication apparatus including a
 universal asynchronous receiver transmitter (UART),
 a half-duplex communication interface driver having
10 a signal subtraction function, and a transmission
 direction switching device; said half-duplex
 communication interface driver being connected to
 said UART via a sending line and to said transmission
 direction switching device via a direction control
15 line; and said transmission direction switching
 device including a data transmission detector and
 a direction-switching rule executor; said method
 comprising the steps of:
- 20 detecting any data transmission by using said data
 transmission detector coupled to said sending line
 to detect any data to be sent and sending said data
 if such data exists; and
- 25 implementing transmission direction switching by
 using said direction-switching rule executor to

receive said data sent by said data transmission detector and generate a negative data in reverse to said data received from said data transmission detector, such that said direction-switching rule
5 executor sends a direction switching signal via said direction control line to said half-duplex communication interface driver to set a transmission direction of said half-duplex communication interface driver to a sending direction when said
10 negative data is a signal 0 or a low signal, or sends a direction switching signal via said direction control line to said half-duplex communication interface driver to set a transmission direction of said half-duplex communication interface driver
15 to a receiving direction when said negative data is a signal 1 or a high signal.

11. The method for switching transmission direction as claimed in claim 10, wherein said half-duplex
20 communication interface driver comprises a driver in compliance with RS485 standard.

12. The method for switching transmission direction as claimed in claim 10, wherein said transmission
25 direction switching device is a programmable logic device.